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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,033	01/31/2001	Bernd Lochel	5373	9689

7590

09/20/2002

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EXAMINER
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BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
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1756

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DATE MAILED: 09/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-6

**Office Action Summary**

Application No.

09/700,033

Applicant(s)

LOCHEL ET AL.

Examiner

Nicole M. Barreca

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 8-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-7 is/are objected to.
- 8) ☒ Claim(s) 1-15 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I claim(s) 1-7, drawn to a method.

Group II, claim(s) 8-15, drawn to an apparatus.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the method and apparatus claims do not share a single novel technical feature. The technical features that the claims of the method and apparatus have in common (i.e. IR radiation source whose power is controllable on the basis of the measured temperature in such a way that the predetermined development of the temperature versus time will be observed during the drying operation) is known in the prior art.

3. During a telephone conversation with Mary Beiner on 8/1/02 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-15 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Specification***

5. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

***Claim Objections***

6. Claims 4-7 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim can not depend on any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 4-7 have not been further treated on the merits.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. While figure 2 illustrates

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a linear, step-shaped increase, as recited in claim 1, there is not disclosure to "any other increase". While the specification does disclose measuring the temperature by means of a pyrometer, as recited in claim 3, there is no disclosure to the temperature being measured from the upper side and with the different emissivity of the substrate being taken into consideration.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite in the phrase "any other increase". The phrase "any other increase" is not defined in the specification and therefore it is not clear what is the scope of the phrase.

Claim 3 recites the limitation "the upper side" in line 3. There is insufficient antecedent basis for this limitation in the claim and it is therefore unclear to what the "upper side" refers.

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 63-70940 in view of Hwang (US Patent 5,705,232) and Kashino (US Patent 5,097,605).

JP 63-70940 discloses heating a resist layer on a resist master disk 4 using an IR heater 6. A radiation thermometer 7 measures the surface temperature of the resist and the measured output is supplied to control 8. The surface temperature is corrected using the measured output of the thermometer.

JP 63-70940 does not disclose that the resist layer is in an deaerated chamber. Hwang teaches a curing method and apparatus using an infrared lamp source. Exhaust pipes 64 are used to purge clean gas, such as nitrogen from the chamber to remove outgassing (col.3, 34-337). Therefore it would have been obvious to one of ordinary skill in the art to dry the resist in a deaerated chamber in the method of JP 63-70940 because Hwang teaches that this will prevent outgassing.

JP 63-9040 does not disclose that the temperature is initially constant and then undergoes a linear, step-shaped or other increase throughout the drying process. Kashino teaches that it is known in the art that the surface temperature of a photosensitive material will remain constant until the residual water ratio reaches a predetermined value, at which point the surface temperature will increase to the temperature of the drying unit. See column 2, lines 1-47 and figure 1. Therefore it would have been obvious to one of ordinary skill in the art that the temperature of the resist in the drying method of JP 63-9040 would initially remain constant and then undergo a linear, step-shaped increase because Kashino teaches that it is known in the

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art that a photosensitive material will behave in this manner due to the presence of residual water.

13. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 63-221618 in view of Hwang (US Patent 5,705,232) and Kashino (US Patent 5,097,605).

JP 63-221618 discloses heating a resist layer on a semiconductor substrate using an infrared lamp 4. The temperature rising characteristics of the wafer (substrate) are inputted into controller 5 in order to control the irradiation intensity of an infrared lamp 4. The temperature and illuminance are monitored by the temperature sensor 6 and illuminance meter 7 and fed back to the controller in order to obtain the optimum temperature rising process. The irradiation intensity of the IR lamp is controlled by the temperature sensor and illuminance sensor.

JP 63-221618 does not disclose that the resist layer is in an deaerated chamber, that the temperature is measured underneath the substrate, or that a pyrometer is used to measure the temperature. Hwang teaches a curing method and apparatus using an infrared lamp source. Exhaust pipes 64 are used to purge clean gas, such as nitrogen from the chamber to remove outgassing (col.3, 34-337). The temperature may be map controlled by the use of thermocouples which preferably contact the wafer on its backside. Optical pyrometers may be used in order to increase measurement points, resulting in superior temperature control (col.3, 38-44). Therefore it would have been obvious to one of ordinary skill in the art to dry the resist in a deaerated chamber in the method of JP 63-221618 because Hwang teaches that this will prevent outgassing. It

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would have been obvious to one of ordinary skill in the art to measure the temperature underneath the substrate or to measure the temperature using pyrometers in the method of JP 63-221618 because Hwang teaches that both will improve temperature control.

JP 63-221618 does not disclose that the temperature is initially constant and then undergoes a linear, step-shaped or other increase throughout the drying process. Kashino teaches that it is known in the art that the surface temperature of a photosensitive material will remain constant until the residual water ratio reaches a predetermined value, at which point the surface temperature will increase to the temperature of the drying unit. See column 2, lines 1-47 and figure 1. Therefore it would have been obvious to one of ordinary skill in the art that the temperature of the resist in the drying method of JP 63-221618 would initially remain constant and then undergo a linear, step-shaped increase because Kashino teaches that it is known in the art that a photosensitive material will behave in this manner due to the presence of residual water.

### ***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 703-308-7968. The examiner can normally be reached on Monday-Thursday (8:00 am-6:30 pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for

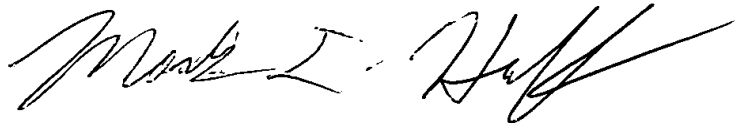


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the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

nmb   
September 18, 2002



**MARK F. HUFF**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**